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elytra slightly paler with a large scutellar spot, a transverse fascia slightly behind middle and wider at sides than at suture, black. The thorax is subopaque and distinctly punctured and the usual setigerous punctures on the alternate elytral intervals are nearly absent; the tibiae are convex on the outer edge. In the Brownsville specimens the suture between the submedian fascia and apex of elytra is narrowly black and from the scutellar spot to the submedian fascia slightly infusate, while the Mexican specimens seem to have the suture more heavily black; otherwise the specimens agree very well with the description.

Class I, HEXAPODA.

Order IV, DIPTERA.

THE NORTH AMERICAN SPECIES OF CUTEREBRA.

BY MYRON H. SWENK,

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Recently, while working over the bot-flies in the collection of the University of Nebraska the writer found among them three species of the genus *Cuterebra* which appeared to be new. Descriptions of these are submitted below, and, in order to show their relationship to our other species and to facilitate their identification, the following table to all the species which have been described from the mainland of North America has been prepared.

Thorax above with the pubescence yellow (1).

Thorax above black, or with black pubescence (5).

1. Scutellum with black pubescence (Wash.).....**scutellaris** Brauer.
1. Scutellum with yellow pubescence (2).
2. A large bare black space on the anterior disc (Ga., Mass.).....**cuniculi** Clark.
2. No such bare space on thorax above (3).
 3. Last segment silvery, with yellow pubescence (Mexico) **analis** Macquart.
 3. Last segment dark, with short black pubescence (4).
4. Abdomen blue-black (Ga., N. Y., Minn., Nova Scotia)**horripilum** Clark.
4. Abdomen reddish brown (Nebr.).....**abdominalis** Swenk.
 5. Pleura mostly yellow or white (6).
 5. Pleura wholly black (15).

6. Abdomen more or less pollinose or pale pubescent (7).
6. Abdomen entirely destitute of pollen or pale pubescence (14).
 7. Pleura with a cluster of black hairs above center (8).
 7. Pleura without a cluster of black hairs above the center, though sometimes with bare black spots (12).
8. Face and cheeks densely gray pollinose, each side of face marked with four polished streaks (Mexico).....**histrio** Coquillet.
8. Face white pollinose with a black spot on lower margin of eye and another midway between it and the mouth (9).
8. Face not marked as above (11).
 9. Front above antennæ on each side with three silvery pollinose spots arranged in a triangle, the two outer ones contiguous to the orbit (Fla., So. Car., Pa., Ky., N. J., Mass., Minn., Nova Scotia).....**buccata** (Fabricius).
 9. Front above antennæ with the two lower spots coalesced into a transverse line extending from the orbit almost to base of antennæ (10).
10. Second abdominal segment with a basal tuft of white hairs on each side (Wyo.)
albifrons Swenk.
10. Second abdominal segment without such a tuft (N. M.).....**lepusculi** Townsend
11. Abdomen with three basal segments partly brown pollinose laterally, leaving bare spots, elsewhere steel-blue (Cal., Wyo., N. M.)..**lepivora** Coquillet.
11. Abdomen with the fourth segment pollinose laterally (Ga., Ariz., N. M., Mexico).....**americana** (Fabricius).
12. Abdomen reddish brown, three last segments partly pollinose, with exposed spots (Cal.).....**latifrons** Coquillet.
12. Abdomen shining blue-black, only two last segments ever pollinose (13).
 13. Two last segments pollinose, with distinct bare spots (Ill., N. Y., Nova Scotia, Mexico) (= *emasculator* Fitch).....**fontinella** Clark.
 13. Penultimate segment with basal half whitish pubescent and with a few bare spots (Minn.).....**sterilator** Lugger.
 13. Penultimate segment, except apical margin, uniformly white pollinose and with long white hairs and no exposed spots, elsewhere entirely steel-blue (Nebr.).....**fasciata** Swenk.
14. Pleura with a cluster of black hairs above the center (Cal., N. M.)
nitida Coquillet.
14. Pleura without a cluster of black hairs above the center (Wyo.)
polita Coquillet.
15. Abdomen entirely destitute of pollen (Cal., Ore., Col., Wyo., S. D.)
tenebrosa Coquillet.
15. Abdomen with the sides of the three basal segments white pollinose (16).
16. Last abdominal segment more or less pollinose (Mexico) (= *terrisona* Walker)
atrox Clark.
16. Last abdominal segment entirely steel-blue, not pollinose (N. M.)
similis Johnson.

Cuterebra abdominalis, new species.

♀. Very close to *C. horripilum*. Head dull black, tinged with brown about ocelli and on a large triangular elevated space on each side, clothed with short black hairs which are much shorter and fewer on the brownish areas. A brownish pollinose

spot is just above the center of each anterior eye margin and contiguous to it. Vertex at narrowest point five times as wide as distance between the posterior ocelli. Facial depression shining black, its extreme basal depth slightly silvery pollinose. Antennæ deep brown, the arista and its hairs black except at extreme apex. Below the facial depression and covering the area between the mouth and lower eye margins is a yellowish pollinosity, relieved by a black spot contiguous to the lower apex of each orbit, another much larger one between this spot and the mouth, and a black line which runs along each margin of the oral slit, widening to a spot posteriorly and connecting with the facial groove anteriorly. The area about the mouth is provided with long yellow hairs, especially posteriorly.

Thorax entirely covered with a long, very dense, brownish-yellow pubescence, longer in a tuft above the wings. Pleura similarly pubescent except for a large space above anterior coxæ which is merely yellowish pollinose with a large, exposed and bare, black spot. Wings brownish. Legs black, with short concolorous pubescence, the femora more or less white pollinose at base exteriorly. Abdomen reddish-brown, shaped as in *horripilum*, the two basal segments clothed dorsally with long brownish-yellow pubescence, denser laterally; elsewhere the pubescence is minute and black. All the segments (only slightly on the second) laterally and below with yellowish pollen relieved by numerous small exposed spots of the ground color. Length, 23 mm. Width of head at vertex, 9 mm.

Type: One female, Lincoln, Nebraska, June. (R. H. Wolcott.)
Collection University of Nebraska.

In addition to the strikingly different coloration of the abdomen, the species differs from *C. horripilum* in the face marks as described and figured by Brauer, having but one orbital pollinose spot above, less silvery pollen in facial depression, a distinct black spot contiguous to lower margin of eye, etc.

Cuterebra albifrons, new species.

♀. Head dull bluish-black on vertex and upper portion of front, except for a brownish Y-shaped elevation surrounding ocelli and extending down the vertex, covered with short, scattered black hairs and a very minute and inconspicuous pale pubescence, the latter most noticeable just above the facial depression. Vertex at narrowest point five times as wide as distance between two posterior ocelli. On a level with the upper edge of the facial depression, and extending from the eye margins nearly to it are two transverse white pollinose bands, broadest at the orbits and extending in uniform width inward for one half their length, then by an abrupt incurving of the upper edge becoming a mere line and again abruptly widening into a subtriangular terminal knob. A short distance above these bands on each side is a small pollinose spot contiguous to the eye. On each side of the facial depression is a gourd-shaped black spot the neck of which connects narrowly with the black of the upper face, otherwise it is completely surrounded by a dense white pollinosity which covers almost the entire lower half of the face. The depression itself is white pollinose, without pubescence, and has a lanceolate black spot on each side of the lower margin. At the lower margin of the eye and contiguous to it is a black spot and between it and the

mouth is another slightly larger one. The pollinosity of the lower face extends behind the eyes to the vertex and is supplemented with a short white pubescence, for the most part thin but becoming long and dense around the margins of the cheeks and about the mouth, extending also upward from the mouth along the raised line to the facial depression. Antennæ with first two joints dark brown, the arista and its hairs blackish except on apical one third, which is pale.

Thorax above dark leaden bluish, without lustre, covered with a very short, thin, black pubescence, this becoming much longer and denser on the scutellum, which is fringed posteriorly with a short but very dense yellowish white fringe. Pleura and under surface of thorax with long, very dense, yellowish white pubescence, extending in a narrow fringe of short dense hair over the wings and along the margins of the thorax. A small tuft of black hairs is just above the center of the pleura, and two adjacent large bare spots are about midway between it and the anterior coxæ, on a pollinose spot bare of pubescence. Two similar spots are just above the intermediate coxæ, and on a similar pollinose spot. Just above the insertion of the posterior legs is a tuft of long black hair. Wings brownish hyaline.

Abdomen shining steel-blue, the basal segment bare, the second segment with a conspicuous tuft of white hair in each side near base, otherwise devoid of pubescence but with a white pollinose space on extreme sides, which is dotted with two or three small exposed dark spots. Following segments steel-blue dorsally but with lateral margins, especially at base, and entire under surface white pollinose, varied with numerous large, round, exposed steel-blue spots and a thin short black pubescence. Legs black, the femora brownish, with short black pubescence, the bases of the femora, especially on intermediate and posterior legs, whitish pollinose; on the posterior legs the femora have the basal half so, as well as the under surface of the tibiæ and the upper surface of the apical tarsal joints. Length, 19 mm. Width of head at vertex, 8.5 mm.

Type: One female specimen, Hecla, Wyoming (S. G. Clason).
Collection University of Nebraska.

This species is closely allied to both *C. buccata* and *C. lepusculi*, but apparently differs from either by possessing the pale hair tufts on the second abdominal segment. The face marks, especially the superior pollinose spots, seem also to differ from either.

***Cuterebra fasciata*, new species.**

♂. Head black, slightly shiny, provided with very short, black hairs. A small triangular white pollinose spot is contiguous to the orbits on each side at upper level of facial depression, and another minute spot between it and the upper extremity of the depression, while still another is located contiguous to the anterior lower margin of each orbit. The extreme lower margin of the head between the eyes is white pollinose, but this is almost concealed by a long, very dense, white pubescence which forms a thick fringe, narrow laterally but widening medially to surround the mouth. The basins of the facial depression are pale silvery pollinose. Antennæ black, the apical two thirds of the arista and its hairs pale. Vertex at narrowest point three times the distance between two posterior ocelli.

Thorax above shining blue-black, clothed with short black hair, a line over the wings connecting with pleura and the pleura themselves covered with long, dense, matted, yellowish white pubescence, not varied with black spots. A dense black fringe around border of scutellum. Wings brownish hyaline. Legs black, shining, clothed with short black pubescence, not pollinose. Abdomen shining steel-blue, clothed with minute black hairs, not pollinose or pale pubescent except on penultimate segment which is, excepting the apical margin, uniformly white pollinose and clothed with long white hairs without exposed black spots. This white band extends over the entire segment and is very conspicuous and contrasting. Length, 16 mm. Width of head at vertex, 7 mm.

Type: One male, Lodgepole, Cheyenne county, Nebraska, July.
Collection University of Nebraska.

A very distinct species belonging to the *fontinella* group.

***Cuterebra tenebrosa* Coquillet.**

The University collection contains a female from Hecla, Wyoming (S. G. Clason) and two males from Sheridan, Wyoming, taken August, 1900, which are referred to this species. They agree with Coquillet's description except in the face marks, for none of these specimens have any pollinose marks whatever on the face. This character, however, as the description intimates, is probably more or less variable in this species. Actual comparison with *tenebrosa* might show specific differences.

ILLUSTRATIONS OF THE ABDOMINAL APPENDAGES OF CERTAIN MOSQUITOES.

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(PLATE VIII.)

***Grabhamia mitchellæ* Dyar.** (Plate VIII, Fig. 1.)

Side piece elongate, outer lobe undeveloped, inner lobe small, setose; clasp moderately swollen centrally though not greatly inflated, with long terminal spine. Harpe jointed, basal part rather straight, uniform, apical filament long, as long as the basal part, uniform, scarcely tapered. Harpago smooth, curved, concave, the tip narrow and bent. Unci invisible. Appendage of the eighth segment small, setose.